

WHAT IS CLAIMED IS:

1. A fuel cell casing comprising:

a base body made of ceramics that has a plurality of concavities formed on one surface thereof, for accommodating therein a membrane electrode assembly, the membrane electrode assembly having a first electrode and a second electrode which are formed on one principal surface and another principal surface thereof, respectively;

a first fluid channel formed so as to extend from a bottom surface of the concavity facing one principal surface of the membrane electrode assembly to an outer surface of the base body;

a first wiring conductor having its one end disposed on the bottom surface of the concavity facing the first electrode of the membrane electrode assembly, and its another end led to the outer surface of the base body;

a lid body mounted on one surface of the base body near the concavity so as to cover the concavity, for sealing the concavity hermetically;

a second fluid channel formed so as to extend from one surface of the lid body facing the other principal surface of the membrane electrode assembly to an outer surface of the lid body;

a second wiring conductor having its one end disposed on one surface of the lid body facing the second electrode of the

membrane electrode assembly, and its another end led to the outer surface of the lid body; and

a third wiring conductor formed in the base body, the third wiring conductor having its one end opposed to the first electrode of the membrane electrode assembly on a bottom surface of one concavity, and its another end opposed to the first electrode of the membrane electrode assembly on a bottom surface of another concavity.

2. A fuel cell casing comprising:

a base body made of ceramics that has a plurality of concavities formed on one surface thereof, for accommodating therein a membrane electrode assembly, the membrane electrode assembly having a first electrode and a second electrode which are formed on one principal surface and another principal surface thereof, respectively;

a first fluid channel formed so as to extend from a bottom surface of the concavity facing one principal surface of the membrane electrode assembly to an outer surface of the base body;

a first wiring conductor having its one end disposed on the bottom surface of the concavity facing the first electrode of the membrane electrode assembly, and its another end led to the outer surface of the base body;

a lid body mounted on one surface of the base body near

the concavity so as to cover the concavity, for sealing the concavity hermetically;

a second fluid channel formed so as to extend from one surface of the lid body facing the other principal surface of the membrane electrode assembly to an outer surface of the lid body;

a second wiring conductor having its one end disposed on one surface of the lid body facing the second electrode of the membrane electrode assembly, and its another end led to the outer surface of the lid body;

a fourth wiring conductor having its one end opposed to the first electrode of the membrane electrode assembly on a bottom surface of one concavity, and its another end led to the other surface of the base body on which the lid body is mounted; and

a fifth wiring conductor having its one end opposed to the second electrode of another membrane electrode assembly of the concavity on one surface of the lid body, and its another end led to one surface of the lid body to be mounted on one surface of the base body, so as to face the other end of the fourth wiring conductor.

3. A fuel cell casing comprising:

a base body made of ceramics that has a concavity formed

on one surface thereof, for accommodating a plurality of membrane electrode assemblies, each membrane electrode assembly having a first electrode and a second electrode which are formed on one principal surface and another principal surface thereof, respectively;

a first fluid channel formed so as to extend from a bottom surface of the concavity facing one principal surface of the membrane electrode assembly to an outer surface of the base body;

a first wiring conductor having its one end disposed on the bottom surface of the concavity facing the first electrode of the membrane electrode assembly, and its another end led to the outer surface of the base body;

a lid body mounted on one surface of the base body near the concavity so as to cover the concavity, for sealing the concavity hermetically;

a second fluid channel formed so as to extend from one surface of the lid body facing the other principal surface of the membrane electrode assembly to an outer surface of the lid body;

a second wiring conductor having its one end disposed on one surface of the lid body facing the second electrode of the membrane electrode assembly, and its other end led to the outer surface of the lid body; and

a third wiring conductor formed in the base body, the third

wiring conductor having its one end opposed to the first electrode of one membrane electrode assembly on the bottom surface of the concavity, and its another end opposed to the first electrode of another membrane electrode assembly on the bottom surface of the concavity.

4. A fuel cell casing comprising:

a base body made of ceramics that has a concavity formed on one surface thereof, for accommodating a plurality of membrane electrode assemblies, each membrane electrode assembly having a first electrode and a second electrode which are formed on one principal surface and another principal surface thereof, respectively;

a first fluid channel formed so as to extend from a bottom surface of the concavity facing one principal surface of the membrane electrode assembly to an outer surface of the base body;

a first wiring conductor having its one end disposed on the bottom surface of the concavity facing the first electrode of the membrane electrode assembly, and its another end led to the outer surface of the base body;

a lid body mounted on one surface of the base body near the concavity so as to cover the concavity, for sealing the concavity hermetically; a second fluid channel formed so as to extend from one surface of the lid body facing the other

principal surface of the membrane electrode assembly to an outer surface of the lid body;

a second wiring conductor having its one end disposed on one surface of the lid body facing the second electrode of the membrane electrode assembly, and its another end led to the outer surface of the lid body;

a fourth wiring conductor having its one end opposed to the first electrode of one membrane electrode assembly on the bottom surface of the concavity, and its another end led to one surface of the base body on which the lid body is mounted; and

a fifth wiring conductor having its one end opposed to the second electrode of another membrane electrode assembly on one surface of the lid body, and its another end led to one surface of the lid body to be mounted on one surface of the base body, so as to face the other end of the fourth wiring conductor.

5. A fuel cell casing comprising:

a base body made of ceramics that has a first concavity and a second concavity formed on its one principal surface side and another principal surface side, respectively, for accommodating therein a membrane electrode assembly, the membrane electrode assembly having a first electrode and a second electrode which are formed on one principal surface and the other principal surfaces thereof, respectively;

a first fluid channel formed within the base body so as to extend from a region between the first and second concavities to a bottom surface of each of the concavities;

a first wiring conductor having its one end disposed on the bottom surface of the first/second concavity so as to face the first electrode of the membrane electrode assembly, and its another end led to the outer surface of the base body;

a first lid body mounted on one principal surface of the base body near the first concavity so as to cover the first concavity, for sealing the first concavity hermetically;

a second lid body mounted on another principal surface of the base body near the second concavity so as to cover the second concavity, for sealing the second concavity hermetically;

a second fluid channel formed so as to extend from a first/second concavity-side principal surface of the first/second lid body, facing the second electrode of the membrane electrode assembly, to an outer surface of the lid body; and

a second wiring conductor having its one end disposed on the first/second concavity-side principal surface of the first/second lid body facing the second electrode of the membrane electrode assembly, and its other end led to the outer surface of the lid body.

6. The fuel cell casing of claim 5, wherein the first fluid channel is arranged such that the openings on the bottom surfaces of the first and second concavities face each other.

7. A fuel cell comprising:

a plurality of membrane electrode assemblies, each having a first electrode and a second electrode which are formed on one principal surface and another principal surface thereof, respectively; and

the fuel cell casing of claim 1,

wherein the membrane electrode assembly is housed in the plurality of concavities of the fuel cell casing, respectively, one and the other principal surfaces of the membrane electrode assembly are arranged such that fluid can be exchanged between one and the other principal surfaces and their corresponding first and second fluid channels, the first and second wiring conductors are electrically connected to the first and second electrodes, respectively, the third wiring conductor is electrically connected to the first electrode, and the lid body is mounted on one surface of the base body near the concavity so as to cover the concavity.

8. An electronic apparatus comprising:

the fuel cell of claim 7, as a power source,  
wherein the base body is made of multi-layer ceramics,  
and an external connection terminal is formed in at least one  
of the base body and the lid body.

9. The electronic apparatus of claim 8, wherein an internal  
circuit is formed in the base body.

10. The electronic apparatus of claim 9, wherein the base body  
has an electronic component which is disposed on the surface  
thereof so as to be electrically connected to the internal  
circuit.

11. The electronic apparatus of claim 8, wherein a  
piezoelectric pump is disposed partway along one of the first  
and second fluid channels.

12. A fuel cell comprising:

a plurality of membrane electrode assemblies, each having  
a first electrode and a second electrode which are formed on  
one principal surface and another principal surface thereof,  
respectively; and

the fuel cell casing of claim 2,

wherein the membrane electrode assembly is housed in the

plurality of concavities of the fuel cell casing, respectively, one and the other principal surfaces of the membrane electrode assembly are arranged such that fluid can be exchanged between one and the other principal surfaces and their corresponding first and second fluid channels, the first and second wiring conductors are electrically connected to the first and second electrodes, respectively, the fourth and fifth wiring conductors are electrically connected to the first and second electrodes, respectively, the other end of the fourth wiring conductor is connected to the other end of the fifth wiring conductor, and the lid body is mounted on one surface of the base body near the concavity so as to cover the concavity.

13. An electronic apparatus comprising:

the fuel cell of claim 12, as a power source,

wherein the base body is made of multi-layer ceramics, and an external connection terminal is formed in at least one of the base body and the lid body.

14. The electronic apparatus of claim 13, wherein an internal circuit is formed in the base body.

15. The electronic apparatus of claim 14, wherein the base body has an electronic component which is disposed on the surface

thereof so as to be electrically connected to the internal circuit.

16. The electronic apparatus of claim 13, wherein a piezoelectric pump is disposed partway along one of the first and second fluid channels.

17. A fuel cell comprising:

a plurality of membrane electrode assemblies, each having a first electrode and a second electrode which are formed on one principal surface and another principal surface thereof, respectively; and

the fuel cell casing of claim 3,

wherein the plurality of membrane electrode assemblies are housed in the concavity of the fuel cell casing, one and the other principal surfaces of the membrane electrode assembly are arranged such that fluid can be exchanged between one and the other principal surfaces and their corresponding first and second fluid channels, the first and second wiring conductors are electrically connected to the first and second electrodes, respectively, the third wiring conductor is electrically connected to the first electrode, and the lid body is mounted on one surface of the base body near the concavity so as to cover the concavity.

18. An electronic apparatus comprising:  
the fuel cell of claim 17, as a power source,  
wherein the base body is made of multi-layer ceramics,  
and an external connection terminal is formed in at least one  
of the base body and the lid body.
19. The electronic apparatus of claim 18, wherein an internal  
circuit is formed in the base body.
20. The electronic apparatus of claim 19, wherein the base  
body has an electronic component which is disposed on the surface  
thereof so as to be electrically connected to the internal  
circuit.
21. The electronic apparatus of claim 18, wherein a  
piezoelectric pump is disposed partway along one of the first  
and second fluid channels.
22. A fuel cell comprising:  
a plurality of membrane electrode assemblies, each having  
a first electrode and a second electrode which are formed on  
one principal surface and another principal surface thereof,  
respectively; and

the fuel cell casing of claim 4,

wherein the plurality of membrane electrode assemblies are housed in the concavity of the fuel cell casing, one and the other principal surfaces of the membrane electrode assembly are arranged such that fluid can be exchanged between one and the other principal surfaces and their corresponding first and second fluid channels, the first and second wiring conductors are electrically connected to the first and second electrodes, respectively, the fourth and fifth wiring conductors are electrically connected to the first and second electrodes, respectively, the other end of the fourth wiring conductor is connected to the other end of the fifth wiring conductor, and the lid body is mounted on one surface of the base body near the concavity so as to cover the concavity.

23. An electronic apparatus comprising:

the fuel cell of claim 22, as a power source,

wherein the base body is made of multi-layer ceramics, and an external connection terminal is formed in at least one of the base body and the lid body.

24. The electronic apparatus of claim 23, wherein an internal circuit is formed in the base body.

25. The electronic apparatus of claim 24, wherein the base body has an electronic component which is disposed on the surface thereof so as to be electrically connected to the internal circuit.

26. The electronic apparatus of claim 23, wherein a piezoelectric pump is disposed partway along one of the first and second fluid channels.

27. A fuel cell comprising:

a plurality of membrane electrode assemblies, each having a first electrode and a second electrode which are formed on one principal surface and the other principal surfaces thereof, respectively; and

the fuel cell casing of claim 5,

wherein the membrane electrode assembly is housed in the first and second concavities of the fuel cell casing, one and the other principal surfaces of the membrane electrode assembly are arranged such that fluid can be exchanged between one and the other principal surfaces and their corresponding first and second fluid channels, the first and second wiring conductors are electrically connected to the first and second electrodes, respectively, and the first/second lid body is mounted on the principal surface of the base body near the first/second

concavity so as to cover the first/second concavity.

28. An electronic apparatus comprising:

the fuel cell of claim 27, as a power source,

wherein the base body is made of multi-layer ceramics, and an external connection terminal is formed in at least one of the base body, the first lid body, and the second lid body.

29. The electronic apparatus of claim 28, wherein an internal circuit is formed in the base body.

30. The electronic apparatus of claim 29, wherein the base body has an electronic component which is disposed on the surface thereof so as to be electrically connected to the internal circuit.

31. The electronic apparatus of claim 28, wherein a piezoelectric pump is disposed partway along one of the first and second fluid channels.